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GLOBAL HEALTH

Most of the World's Vaccines Likely Won't Prevent Infection From Omicron

They do seem to offer significant protection against severe illness, but the consequences of rapidly spreading infection worry many public health experts.

By Stephanie Nolen

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A growing body of preliminary research suggests the Covid vaccines used in most of the world offer almost no defense against becoming infected by the highly contagious Omicron variant.

All vaccines still seem to provide a significant degree of protection against serious illness from Omicron, which is the most crucial goal. But only the Pfizer and Moderna shots, when reinforced by a booster, appear to have success at stopping infections, and these vaccines are unavailable in most of the world.

The other shots — including those from AstraZeneca, Johnson & Johnson and vaccines manufactured in China and Russia — do little to nothing to stop the spread of Omicron, early research shows. And because most countries have built their inoculation programs around these vaccines, the gap could have a profound impact on the course of the pandemic.

A global surge of infections in a world where billions of people remain unvaccinated not only threatens the health of vulnerable individuals but also increases the opportunity for the emergence of yet more variants. The disparity in the ability of countries to weather the pandemic will almost certainly deepen. And the news about limited vaccine efficacy against Omicron infection could depress demand for vaccination throughout the developing world, where many people are already hesitant or preoccupied with other health problems.

Most evidence so far is based on laboratory experiments, which do not capture the full range of the body's immune response, and not from tracking the effect on real-world populations. The results are striking, however.

The Pfizer and Moderna shots use the new mRNA technology, which has consistently offered the best protection against infection with every variant. All of the other vaccines are based on older methods of triggering an immune response.

The Chinese vaccines Sinopharm and Sinovac — which make up almost half of all shots delivered globally — offer almost zero protection from Omicron infection. The great majority of people in China have received these shots, which are also widely used in low-and middle-income countries such as Mexico and Brazil.

A preliminary effectiveness study in Britain found that the Oxford-AstraZeneca vaccine showed no ability to stop Omicron infection six months after vaccination. Ninety percent of vaccinated people in India received this shot, under the brand name Covishield; it has also been widely used across much of sub-Saharan Africa, where Covax, the global Covid vaccine program, has distributed 67 million doses of it to 44 countries.

Workers unloaded a shipment of China's Sinopharm vaccine in Bujumbura, Burundi. China's Sinopharm and Sinovac vaccines together make up almost half of all the shots delivered globally. Tchandrou Nitanga/Agence France-Presse — Getty Images

Administering the AstraZeneca shot in Milan. Alessandro Grassani for The New York Times

Researchers predict that Russia's Sputnik vaccine, which is also being used in Africa and Latin America, will show similarly dismal rates of protection against Omicron.

Demand for the Johnson & Johnson vaccine had been surging in Africa, because its single-shot delivery regimen makes it easy to deliver in low-resource settings. But it too has shown a negligible ability to block Omicron infection.

Antibodies are the first line of defense induced by vaccines. But the shots also stimulate the growth of T cells, and preliminary studies suggest that these T cells still recognize the Omicron variant, which is important in preventing severe disease.

"What you lose first is protection against asymptomatic mild infection, what you retain much better is protection against severe disease and death," said John Moore, a virologist at Weill Cornell Medicine in New York. He called it "a silver lining" that Omicron so far appears less lethal than the Delta variant.

But this protection will not be enough to prevent Omicron from causing global disruption, said J. Stephen Morrison, director of the Global Health Policy Center at the Center for International and Strategic Studies.

"The sheer scale of infection will overwhelm health systems, simply because the denominator will be potentially so big," he said. "If you have a burst of infection worldwide, a shock, what does the world look like on other side of it? Is it, 'The war is over,' or, 'The war has just entered another phase'? We haven't begun thinking about any of that."

People with breakthrough cases may experience only asymptomatic infection or mild illness, but they can pass the virus to unvaccinated people, who could fall more severely ill, and become a source of new variants.

A Sinovac vaccination in Cachoeira do Piria, Brazil, in January. Experts fear news of limited vaccine efficacy against Omicron will depress demand for vaccination in places where people are already hesitant. Tarso Sarraf/Agence France-Presse — Getty Images

Monks signed up for AstraZeneca's shot in Bangkok in April. Adam Dean for The New York Times

Dr. Seth Berkley, the chief executive of Gavi, the global vaccine alliance, said that more data was needed before drawing conclusions about vaccines' effectiveness against Omicron — and that accelerated vaccination should continue to be the focus of pandemic response.

Preliminary data from South Africa suggest that with Omicron, there is a much higher chance of people who already had Covid getting reinfected than there was with the original virus and previous variants. But some public health experts say they believe that countries that have already been through brutal waves of Covid, such as Brazil and India, may have a buffer against Omicron, and vaccination after infection produces high antibody levels.

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Updated Dec. 18, 2021

- Biden will address the nation about Omicron on Tuesday as cases rise.
- A Washington State senator died at 52 after a Covid infection.
- Some Southeast Asian tourism spots reopen, but arrivals are down from millions to dozens.

"The combination of vaccination and exposure to the virus seems to be stronger than only having the vaccine," said Ramanan Laxminarayan, an epidemiologist in New Delhi. India, he noted, has an adult vaccination rate of only about 40 percent but 90 percent exposure to the virus in some areas.

"Without a doubt Omicron is going to flood through India," he said. "But hopefully India is protected to some extent because of vaccination and exposure."

China does not have this layer of protection to back up its weak vaccines. Because of China's aggressive efforts to stop spread of the virus within its borders, relatively few people have previous exposure. Only an estimated 7 percent of people in Wuhan, where the pandemic began, were infected.

Much of Latin America has relied on the Chinese and Russian vaccines, and on AstraZeneca. Mario Rosemblatt, a professor of immunology at the University of Chile, said that more than 90 percent of Chileans had had two doses of one vaccine, but the great majority of these were Coronavac, the Sinovac shot. High vaccination coverage combined with early reports that Omicron does not cause serious illness is leading to a false sense of security in the country, he said.

The Coronavirus Pandemic: Key Things to Know

A new U.S. surge. The C.D.C said that the Omicron variant's rapid spread in the U.S. may portend a surge in infections as soon as January, but cases are already spiking, leading offices to cancel holiday parties, Broadway performances to be shuttered and college finals to be moved online.

"We have to get people to understand that it doesn't work like that: If you get high transmissibility you're going to have the health system saturated because the number of people getting ill will be higher," he said.

Brazil has recommended that all vaccinated people get a third dose, and it started using Pfizer's vaccine for all boosters, but only 40 percent of the vaccinated have turned up to get the extra shot. Dr. Amilcar Tanuri, a virologist at the Federal University of Rio de Janeiro, said with cautious optimism that the high levels of previous Covid exposure might blunt Omicron's impact but noted that the most vulnerable Brazilians, vaccinated first, got Coronavac, and tens of millions more were given AstraZeneca.

A woman given the Johnson & Johnson vaccine at a clinic in Chongwe District, Zambia. Demand for J.&J.'s single-shot regimen had been surging in Africa, as it is easy to deliver in low-resource settings. João Silva/The New York Times

Delivery of Covidshield vaccines, India's formulation of the AstraZeneca shot, to Gosaba Island in West Bengal, India. Rupak De Chowdhuri/Reuters

Mr. Morrison called Omicron's ability to evade the protection of vaccination "a massive setback" for low- and middle-income countries, where, far from any discussion of boosters, the focus is still on delivering first shots.

"The world gets cleaved into two parts, right?" he said. "It's those that have a quick path toward boosters versus those who have had very limited progress and suddenly they're subject to this new lashing."

Just 13 percent of people in Africa have received a least one dose of a Covid vaccine.

Dr. Laxminarayan said the Indian government, to which he is an occasional adviser, was considering booster shots, but the Delta variant still poses a significant threat in India, and two vaccine doses offers protection against Delta. That presents the government with a difficult choice between focusing on getting people who remain unvaccinated, or only partly vaccinated, to two doses, or trying to gets boosters to older people and those with high-risk medical conditions as protection against Omicron.

The news that the non-mRNA vaccines offer little protection against infection from Omicron may further erode demand for shots in countries already struggling to build demand, Mr. Morrison said.

"This challenges the whole value of vaccines," he said. "If you're so far behind and then you suffer this, it's going to feed anti-vaccine sentiment and weaken confidence."

Tolbert Nyenswah, a senior researcher with the Johns Hopkins Bloomberg School of Public Health, said the emerging threat to countries in the global south that have relied on non-mRNA vaccines was an indictment of wealthy countries' failure to share that technology or help build production points in low- and middle-income countries.

As a consequence, dangerous variants will continue to emerge from areas with low vaccination coverage and will prolong the pandemic, predicted Dr. Nyenswah, who was deputy minister of health in Liberia through that country's worst Ebola outbreak.

Filling out paperwork to receive the Sputnik vaccine in Moscow in July. Sergey Ponomarev for The New York Times

Nurses went house-to-house to deliver the Sinopharm vaccine in the Villa Maria del Triunfo neighborhood of Lima, Peru. Martin Mejia/Associated Press

Dr. Berkley at Gavi said it would be a serious mistake for countries to ease up on their vaccination push or to assume that only mRNA vaccines are worth distributing.

“We may be seeing a situation where countries say, ‘If developed countries don’t want these vaccines, then we don’t want these vaccines,’” he said. “That, of course, would be the wrong interpretation, if it turns out that these vaccines prevent against severe disease and death.”

Lynsey Chutel. Carl Zimmer and Emily Schmall contributed reporting.